PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of

Satoshi AOYAMA et al. Attn: PCT Branch

Application No. New U.S. National Stage of PCT/JP04/003144

Filed: October 13, 2005 Docket No.: 125602

For: FUEL CELL SYSTEM

TRANSLATION OF THE ANNEXES TO THE INTERNATIONAL PRELIMINARY EXAMINATION REPORT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Attached hereto is a translation of the annexes to the International Preliminary Examination Report (Form PCT/IPEA/409). The attached translated material replaces the claims.

Respectfully submitted,

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Date: October 13, 2005

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Amended claim set

Claims:

1 (Amended). A fuel cell system, comprising:

fuel cell having an anode, a cathode, and an electrolyte membrane as a laminate of an electrolyte layer and a hydrogen permeable metal layer composed of a hydrogen permeable material;

a fuel gas supply module that supplies a fuel gas containing hydrogen and a hydrocarbon compound to the anode; and

an oxidizing gas supply module that supplies an oxidizing gas to the cathode,

wherein the anode of the fuel cell have a catalyst supported for causing an endothermic reaction of the hydrocarbon compound.

2. A fuel cell system in accordance with claim 1, wherein the fuel gas supply module comprises:

a reformer unit that generates hydrogen through a reforming reaction of a selected material; and

a reform control unit that controls operation of the reformer unit to generate the hydrocarbon compound with hydrogen.

3. A fuel cell system in accordance with claim 2, wherein the hydrocarbon compound is methane.

4. A fuel cell system in accordance with claim 3, wherein the catalyst is a methane reforming catalyst including at least one of Ni, Rh, Ru, and their alloys.

5. A fuel cell system in accordance with any one of claims 2 through 4, said fuel cell system further comprising:

a supply unit that supplies oxygen and steam to the reformer unit,

wherein the reform control unit controls the operation of the reformer unit to cause a partial oxidation reaction of the selected material with the supplied oxygen for production of hydrogen to proceed in parallel with steam reforming reaction of the selected material with the supplied steam for production of hydrogen.

6. A fuel cell system in accordance with any one of claims 2 through 5, said fuel cell system further comprising:

a temperature control unit that controls an operation temperature of the fuel cell to a preset target temperature to regulate an amount of heat generated by the reaction in the fuel cell.

7. A fuel cell system in accordance with claim 6, wherein the temperature control unit controls internal temperature of the reformer unit to make a difference between the internal temperature of the reformer unit and the operation temperature of the fuel cell within a preset range.

8. A fuel cell system in accordance with any one of claims 1 through 7, wherein the reaction proceeding in the fuel cell is a heat-involved reversible reaction.

9 (Amended). A fuel cell system in accordance with any one of claims 1 through 8, wherein the electrolyte layer is made of an inorganic material, and

the hydrogen permeable metal layer forms a base of the electrolyte layer.

10 (Amended). A fuel cell system in accordance with any one of claims 1 through 8, wherein the electrolyte layer is formed as a water-containing electrolyte layer having a water content, and

the hydrogen permeable metal layer is formed on both faces of the water-containing electrolyte layer.

11 (Amended). A control method of controlling operation of a fuel cell system, said fuel cell system comprising: a fuel cell having an anode, a cathode, and an electrolyte membrane as a laminate of an electrolyte layer and a hydrogen permeable metal layer composed of a hydrogen permeable material, where a catalyst is supported on the anode for causing an endothermic reaction of a hydrocarbon compound; a fuel gas supply module that supplies a fuel gas containing hydrogen and the hydrocarbon compound

and an oxidizing gas supply module that supplies an oxidizing gas to the cathode,

said control method comprising the steps of:

setting a target temperature in operation of the fuel cell; and

controlling an operation temperature of the fuel cell to the target temperature to regulate an amount of heat produced by a reaction in the fuel cell.